# Is Avian Predation so Important in Keeping Down Butterfly Populations?

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In almost every publication related to birds and/or insects, emphasis is made on the intensive predation that insects suffer from birds. Many times birds are drawn with a butterfly, wings widely spread, in their beak, while still flying or while perching on a tree. We are fully aware of effective avian predation on many kinds of insects, either in the adult stage or in the immatures. Usually this phenomenon is beneficial to agriculture, very few exceptions being harmful (as birds feeding on bees).

During the period 1935-1945, in El Salvador, one of us (A.M. Sr.) had every year the opportunity of watching massive migrations of *Schistocera* spp. or *Melanoplus* spp. (Orthoptera-Acrididae) and seeing many sorts of birds actively feeding on them, and was able to determine a few of them: *Trogon* spp. (Trogonidae); *Eumomota superciliosa* and *Momotus momota* (Momotidae); *Centurus pucherani* (Picidae); *Pitangus sulphuratus* and *Muscivora tyrannus* (Tyrannidae); *Campylorhynchus rufinucha* (Troglodytidae); *Turdus assimilis* (Turdidae); *Cassidix mexicanus* and *Icterus* spp. (Icteridae); *Piaya cayana* and *Crotophaga* spp. (Cuculidae); *Panyptila cayennensis* (Apodidae); *Calocitta formosa* (Corvidae).

There were, of course, many others, but it was not possible to determine them with certainty. Then, during the period 1958-1968, observations were made of birds, *Pitangus sulphuratus, Muscivora tyrannus* (Tyranidae) and *Crotophaga* spp. (Cuculidae) in particular, catching noctuid and arctiid moths flushed out of cotton plantations by people working there. Every year also, we see happen during the month of March the phenomenon of multitudinous adult emergence of Cicadas of various sorts (*Tibicen*?) which invade coffee plantations and forests, where birds of many species feed voraciously on them. Occasionally we have observed birds catching undetermined moths, tettigonids, wasps, ants' queens, flies and beetles on the wing. We have watched birds (*Campylorhynchus rufinucha*) feeding their youngsters in the nest with lepidopterous larvae of many kinds, including larvae we were rearing of *Danaus plexippus* (Danaidae), *Agraulis vanillae* and *Heliconius petiverana* (Heliconiidae), which are reputed as being protected by the noxious fluids of the plants they feed on: *Asclepias curassavica* (Asclepiaciae) and various species of Passifloraceae respectively. (Do these birds so build an immunity to these plant poisons?) Still we have never seen a bird catch a flying butterfly!

Dr. A. H. B. Rydon (*personal communication*), while collecting *Charaxes* spp. in Africa, observed undetermined birds position themselves above a trap, apparently in the hope of getting an easy meal.

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One day, some three years ago, we saw a bird carry away a *Consul fabius* (Charaxidae) while it was trying to disentangle itself from a spider web. A friend Ornithologist, Dr. Walker A. Thurber, reported to us birds feeding on Danaidae and Pieridae butterflies ensnared in the nets he uses to band birds. It is worthwhile what he observed: the birds ate the heads of the butterflies, while he was watching, and flew away leaving the body and wings untouched. Later on, the bodies had also disappeared, but he is not sure if it was due to the birds eating them or some other animal. We certainly have seen small birds roaming in a grove of *Passiflora edulis* trying to catch approaching females of *Dione juno* without a single success. Not long ago we twice saw a Great-tailed Grackle (*Cassidix mexicanus*) attack unsuccessfully a large female of *Morpho polyphemus* flying leisurely in the open, along a city boulevard. On these occasions *D. juno* and *M. polyphemus* females very calmly avoided capture by simply changing their flight level, without even hurrying afterwards.

It is true that we have found beak marks on some butterflies netted. In most cases these marks affect simultaneously both opposite wings, suggesting that the attack happened while the wings were folded, either when feeding or while at rest. Other tears on a single wing might have been caused either by a bird's beak or by the many thorns of the vegetation among which the butterflies travel, mostly when scared.

On the other hand we have every year, around the 20th of November, vast migrations of Pieridae, chiefly *Eurema daira,* moving rather slowly from South to North. From 7th June to 18th June, 1970, we witnessed a spectacular migration of *Marpesia chiron* (Cyrestidae), during which period thousands of individuals could be seen on the wing at any particular moment during the solar hours. Even if there was a fair abundance of birds belonging to the species mentioned above at the place we used as a look out, and though there was a whole colony of *Panyptila cayennensis* nesting in a wall close by, we could never detect a single capture, and hardly any intent from the birds to catch a butterfly. (It is to be noted that *Marpesia chiron* has never been reported as an unpalatable species to predators! )

The only instance of a live butterfly in the mouth of a predator, other than insect or Arachnid predator, we have seen during the many years of observations, has been a *Phoebis philea* (Pieridae), whose body was held ventrally in the jaws of a large crested lizard. After 10 or 15 minutes, the lizard moved away, the butterfly still flapping its wings vigorously.

Yet we read many reports of experiments carried out to determine the palatability or unpalatability of many species of butterflies, where caged birds avoid, peck or consume some of the butterflies offered to them. In all these experiences, the butterflies were dead, frozen, thawed and later spread before presenting them to the caged birds. The birds consequently did not have to make any effort to get them.

We feel that a butterfly, free and alive, will not fulfil the conditions to be appealing as a prey to a predator, as was so keenly expressed by Dr. Valverde: "The appeal a prey has to a potential predator is in direct relation to the amount of energy the predator would derive from eating it, and in inverse relation to the amount of energy the predator has to spend to capture it."

Even if there must be in nature some instances when a hungry bird succeeds in catching a butterfly in flight, it is far from being a common happening as it is assumed by many indoor naturalists.

The relatively slow flight of butterflies, as compared to the rapid flight of other insects (e.g. Coleoptera, Homoptera, Diptera, Hymenoptera, etc.) is very deceptive due to the slow flapping of the rather large wings, which permit the butterfly sudden changes of level and direction, thus easily fooling the rushing attack of an also flying and heavier bird. To pursue and capture under such conditions would entail a large consumption of energy on the part of the predator, with a meagre amount of edible matter (head, body and legs) if finally successful. On the contrary Coleoptera, Cicadidae, Diptera, Heterocera, Orthoptera, etc., even if they have a very fast flight, it is more straight, and their relatively stout bodies offer a worthy reward for the efforts, even if repeated, of the hunter.

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NYMPHALIS ANTIOPA (L.) IN CAITHNESS. — At 3 p.m. on 18th August my wife and I, whilst collecting larvae of *Lasiocampa quercus* ssp. *callunae* Palmer in a somewhat remote part of the heather/peat country of Caithness, were having lunch in a quarry at about 1,000 ft. A large butterfly suddenly entered and alighted on a rock about 10 yards from us. It was *Nymphalis antiopa* (L.) and at the temperature which was about 70°F., it rapidly took flight in a westerly direction.

The only other possible Scandinavian immigrants were *Eurois occulta* (L.) which we took in small numbers in Caithness at M.V., all f. *typica* and no melanics, as also later at Kinveachy Forest, near Aviemore, between 22nd August and 1st September. We also saw a small number of *Vanessa atalanta* at both places. Perhaps the most surprising observation is that there were so few of the normal migrant species which usually find their way into Scotland. — H. B. D. KETTLEWELL, Department of Zoology, South Parks Road, Oxford, OX1 3PS.